

WHAT IS CLAIMED IS:

1. An engine control device for controlling an engine to move a matching point according to a load applied to the engine on an engine torque diagram having an axis representing an engine speed and an axis representing torque, wherein:

a target torque line is set to pass through a fuel consumption minimum point, where a fuel consumption rate becomes minimum, or to pass through a vicinity of the fuel consumption minimum point on the engine torque diagram, and the engine is controlled to match at a point on the target torque line.

2. An engine control device for controlling an engine to move a matching point according to a load applied to the engine on an engine torque diagram having an axis representing an engine speed and an axis representing torque, wherein:

a target torque line is set to pass through a fuel consumption minimum point, where a fuel consumption rate becomes minimum on individual equal horsepower curves of the engine torque diagram, or to pass through a vicinity of the fuel consumption minimum point, and the engine is controlled to match at a point on the target torque line.

3. The engine control device according to Claim 1, wherein the engine is controlled to match at a point on the target torque line including a line segment which connects a torque point at a time of rated output and the fuel consumption minimum point or the vicinity of the fuel consumption minimum point.

4. The engine control device according to Claim 1, wherein the engine is controlled to match at a point on the target torque line which connects a torque point at a time of rated output, the fuel consumption minimum point or the vicinity of the fuel consumption minimum point and a deceleration point at a time of auto deceleration or a vicinity of the deceleration point.

5. An engine control device for controlling an engine by a governor to move a matching point according to a load applied to the engine on an engine torque diagram having an axis representing an engine speed and an axis representing torque, wherein:

a target torque line is set to pass through a fuel consumption minimum point, where a fuel consumption rate becomes minimum on the engine torque diagram or to pass through a vicinity of the fuel consumption minimum point;

individual regulation lines are set to connect individual matching target rotational speeds and individual instructed rotational speeds on the target torque line;

the governor injects fuel in an amount corresponding to a difference between an instructed rotational speed and a real rotational speed into the engine; and

a command to change the instructed rotational speed by a portion corresponding to a difference between a matching target rotational speed and the real rotational speed is given to the governor.

6. An engine control device for controlling an engine by a governor to move a matching point according to a load applied to the engine on an engine torque diagram having an axis representing an engine speed and an axis representing torque, wherein:

a target torque line is set to pass through a fuel consumption minimum point, where a fuel consumption rate becomes minimum on individual equal horsepower curves of the engine torque diagram, or to pass through a vicinity of the fuel consumption minimum point;

individual regulation lines are set to connect individual matching target rotational speeds and individual instructed rotational speeds on the target torque line;

the governor injects fuel in an amount corresponding to a difference between an instructed rotational speed and a real rotational speed into the engine; and

a command to change the instructed rotational speed by a portion corresponding to a difference between a matching target rotational speed and the real rotational speed is given to the governor.

7. The engine control device according to Claim 1, wherein:
an electric motor is coupled to an output shaft of the engine; and
the electric motor is operated when the matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.
8. The engine control device according to Claim 5, wherein:
an electric motor is coupled to an output shaft of the engine;
an upper limit line specifying a maximum injection amount of fuel is set between an engine maximum torque line and the target torque line on the engine torque diagram;
and
the electric motor is operated when an injection amount corresponding to a difference between an instructed rotational speed and a real rotational speed exceeds the maximum injection amount specified by the upper limit line.
9. An engine control device for controlling an engine to move a matching point, where engine power torque matches absorption torque of a hydraulic pump, on an engine torque diagram having an axis representing an engine speed and an axis representing torque, wherein:
a target torque line is set in an area on the engine torque diagram where the engine has a low rotational speed and the hydraulic pump has a large displacement, and the engine is controlled to match at a point on the target torque line.
10. An engine control device for controlling an engine to move a matching point, where engine power torque matches absorption torque of a hydraulic pump, on an engine torque diagram having an axis representing an engine speed and an axis representing torque, wherein:
a second target torque line, where the engine has a low rotational speed and the

hydraulic pump has a large displacement, is set with respect to a first target torque line which passes through a fuel consumption minimum point, where a fuel consumption rate becomes minimum on individual equal horsepower curves of the engine torque diagram, or passes through a vicinity of the fuel consumption minimum point; and

the engine is controlled to match at a point on the second target torque line.

11. An engine control device for controlling an engine to move a matching point, where engine power torque matches absorption torque of a hydraulic pump, on an engine torque diagram having an axis representing an engine speed and an axis representing torque, wherein:

a first target torque line is set to pass through a fuel consumption minimum point, where a fuel consumption rate becomes minimum on individual equal horsepower curves of the engine torque diagram, or pass through a vicinity of the fuel consumption minimum point;

a second target torque line, where the engine has a low rotational speed and the hydraulic pump has a large displacement, is set with respect to the first target torque line;

either the first target torque line or the second target torque line is selected; and

the engine is controlled to match at a point on the selected target torque line.

12. The engine control device according to Claim 9, further comprising means for controlling to have a prescribed differential pressure between a discharge pressure of the hydraulic pump and a load pressure of a hydraulic actuator.

13. The engine control device according to Claim 9, wherein:

an electric motor is coupled to an output shaft of the engine; and

the electric motor is operated when a matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.

14. The engine control device according to Claim 2, wherein the engine is controlled to match at a point on the target torque line including a line segment which connects a torque point at the time of rated output and the fuel consumption minimum point or the vicinity of the fuel consumption minimum point.

15. The engine control device according to Claim 2, wherein the engine is controlled to match at a point on the target torque line which connects a torque point at a time of rated output, the fuel consumption minimum point or the vicinity of the fuel consumption minimum point and a deceleration point at a time of auto deceleration or a vicinity of the deceleration point.

16. The engine control device according to Claim 3, wherein the engine is controlled to match at a point on the target torque line which connects the torque point at the time of rated output, the fuel consumption minimum point or the vicinity of the fuel consumption minimum point and a deceleration point at a time of auto deceleration or a vicinity of the deceleration point.

17. The engine control device according to Claim 2, wherein:
an electric motor is coupled to an output shaft of the engine; and
the electric motor is operated when the matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.

18. The engine control device according to Claim 3, wherein:
an electric motor is coupled to an output shaft of the engine; and
the electric motor is operated when the matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.

19. The engine control device according to Claim 4, wherein:

an electric motor is coupled to an output shaft of the engine; and
the electric motor is operated when the matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.

20. The engine control device according to Claim 5, wherein:
an electric motor is coupled to an output shaft of the engine; and
the electric motor is operated when the matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.

21. The engine control device according to Claim 6, wherein:
an electric motor is coupled to an output shaft of the engine; and
the electric motor is operated when the matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.

22. The engine control device according to Claim 6, wherein:
an electric motor is coupled to an output shaft of the engine;
an upper limit line specifying a maximum injection amount of fuel is set between an engine maximum torque line and the target torque line on the engine torque diagram;
and

the electric motor is operated when an injection amount corresponding to a difference between an instructed rotational speed and a real rotational speed exceeds the maximum injection amount specified by the upper limit line.

23. The engine control device according to Claim 10, further comprising means for controlling to have a prescribed differential pressure between a discharge pressure of the hydraulic pump and a load pressure of a hydraulic actuator.

24. The engine control device according to Claim 11, further comprising means for

controlling to have a prescribed differential pressure between a discharge pressure of the hydraulic pump and a load pressure of a hydraulic actuator.

25. The engine control device according to Claim 10, wherein:
an electric motor is coupled to an output shaft of the engine; and
the electric motor is operated when the matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.

26. The engine control device according to Claim 11, wherein:
an electric motor is coupled to an output shaft of the engine; and
the electric motor is operated when the matching point moves on the engine torque diagram in a direction that a load applied to the output shaft becomes large.